William Dunbar to Thomas Jefferson, October 8, 1805, from Thomas Jefferson and Early Western Explorers, Transcribed and Edited by Gerard W. Gawalt, Manuscript Division, Library of Congress

William Dunbar to Thomas Jefferson

Natchez 8th October 1805

Dear Sir

I have by this mail written to the Secretary at War, and given him the reasons of our tardy progress respecting the red river expedition.

In your last you mentioned the name of Colo. Freeman as a proper assistant to the principal Conductor of the expedition not knowing any person of that name but the officer commanding the troops at New Orleans, I concluded that he had expressed a desire to go upon the expedition, in this I find that I have committed a mistake as that Gentleman Knows nothing of the matter, I am therefore at a loss to know who was intended: as it appears that we shall still suffer some delay, I should be very glad if a qualified person could be sent on either as principal or Second: it would seem that we must give up the idea of finding persons qualified in any other department of Science but merely the geographical part; a good disposition to observe and record such new objects as may present themselves must Supply the rest.

I mentioned in my last that one very simple method had occured to me of ascertaining in certain Circumstances the Longitude of places, which is much better calculated for

travellers by land than Voyagers by Sea; the method is such that a Single observer with a good altitude instrument, altho' deprived

of the use of a time keeper, may still make useful observations for the advancement of geographical Knowledge. I shall now just mention the principles & shall hereafter Send you some examples of the Calculation. The excellence of the usual lunar method of determining the Longitude depends (supposing her theory to be perfect) upon her quick change of place from west to east; but it cannot be denied that it requires great dexterity to make good observations, which is evident from the disproportion of the times to the distances in the hands of the best Observers, and this arises from the slow progress of the moon which Causes the Contact to appear to be continued for many seconds of time; were this observation similar to a meridian altitude, it might certainly be taken to any desireable accuracy, that is, were the motion of the moon from North to South in place of from West to east, the moon's altitude when brought upon the meridian by the rotation of the earth would furnish an easy & very Correct mode of ascertaining the Longitude: Now altho' the proper motion of the moon is from West to East, yet her orbit makes so considerable an angle with the equinoctical circle, that there are two portions of each lunation when the moon's change of declination is very rapid, exceeding 6 in 24 hours, that is 5" of a degree in one minute of time; if therefore under favorable Circumstances we take the moon's greatest altitude near the meridian, we shall thence be enabled to ascertain the moon's declination at the moment

of her passing our meridian; we must then find the time at Greenwich when the moon had that declination and also the time when the moon passed the meridian of Greenwich, from which data the Longitude is easily found: this method will require the use of some interpolations and an equation for the Correction of the Moon's altitude on the Meridian, because her greatest altitude will not be on the meridian, but to the East or West according as She is increasing or diminishing her North polar distance. I have communicated this

method to my Worthy friend Mr. Briggs who is pleased with the idea & intends giving it consideration. I have the honor to be with high respect and attachment,

Your most Obedient Servant, William Dunbar

RC in the Thomas Jefferson Papers, Library of Congress.